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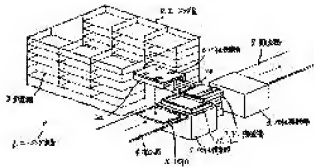
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(54) METHOD AND DEVICE FOR AGING PLASMA DISPLAY PANEL

(57)Abstract:

PROBLEM TO BE SOLVED: To efficiently and surely perform the aging, without requiring labor in an aging device for plasma display panel for performing display with plasma discharge.

SOLUTION: An aging device for plasma display panel which supplies voltage to an electrode group inside of a panel for lighting all discharge cells for a predetermined time is constituted at least of trays 11 having a short bar for connecting the electrode group of a panel 10 in common and a connecting terminal to be connected to an aging voltage source, aging chamber 2 having shelves 3 for housing the tray 11, an aging voltage source and a connecting terminal connected to the aging voltage source and capable of being connected to the connecting terminal on the tray 11, and a carrier 7 for carrying the tray 11 into the shelf of the aging chamber for connection of both the connecting terminals.



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[Document Name] Description

[Title of the Invention] The aging method and equipment of a plasma display panel

[Claim(s)]

[Claim 1] It is aging equipment of the plasma display panel which supplies voltage to the electrode group in a panel, and changes all the electric discharge cells into a predetermined time lighting state. The tray which has a short bar for making common connection of the electrode group of the panel concerned, and a contact button to the source for aging of voltage at least, The aging room which is connected to the shelf and the source for aging of voltage in which this tray is accommodated, and this source for aging of voltage, and has a contact button on said tray, and a connectable contact button at least, Aging equipment of the plasma display panel which is equipped with the conveyance machine to which said tray is made to carry in to the shelf of said aging room, and both contact button is connected, and is characterized by things.

[Claim 2] The aging room which has two or more installation shelves to which a power supply is connected in the aging equipment of a plasma display panel, The panel wearing machine which pinches a plasma display panel and enables movement in the state, The panel applied part equipped with the plasma display panel which installs a tray equipped with the short bar connected to the control circuit which generates the control signal for aging, and this control circuit, and is moved to this tray by said panel wearing machine, While having the panel secession part which installs the tray equipped with said plasma display panel, and removes a plasma display panel from a tray, and a move mechanism and an up-and-down motion mechanism It has the telescopic arm which delivers the tray to said panel applied part and a panel secession part, and the installation shelf of the aging interior of a room. Aging equipment of the plasma display panel which possesses the tray conveyance machine which performs tray conveyance to an installation shelf from a panel applied part, and tray conveyance to a panel secession part from an installation shelf, and is characterized by things.

[Claim 3] The short bar with which said tray is equipped is aging equipment of the plasma display panel according to claim 1 or 2 characterized by being prepared in the movable board which consists of a pair of slide boards, and which can be rotated.

[Claim 4] Said panel applied part is the aging method of the plasma display panel according to claim 2 characterized by being the composition which is equipped with a power supply and can carry out inspection lighting of the plasma display panel of a wearing state.

[Claim 5] Said panel secession part is aging equipment of the plasma display panel according to claim 2 or 4 which is equipped with a power supply and characterized by being the composition which can carry out inspection lighting of the plasma display panel from which it is made to secede.

[Detailed Description of the Invention]

[0001]

[Field of the Invention] This invention relates to the aging equipment of the plasma display panel which displays by plasma electric discharge. The plasma display panel (Following PDP is called) attracts attention as a display device replaced with a cathode-ray tube, and promising ** is carried out for the use of the large-sized display of high-definition television etc.

[0002] In such PDP, obtaining the high thing of the display quality which maintains the electric discharge characteristic stabilized over the long period of time with sufficient mass-production nature is called for.

[0003]

[Description of the Prior Art] For example, the display electrode which demarcates the electric discharge cell for a display is covered with dielectric layers, such as sealing glass, and faces AC type PDP of 3 electrode structures a display. By the write-in address method or the elimination address method, after storing up wall charge in the electric discharge cell for addresses which should be made to emit light (lighting) alternatively, electric discharge maintenance voltage (SASUTE impulse) is impressed to a pair of display electrodes by turns, and electric discharge is produced periodically.

[0004] By the way, in PDP, after enclosing electric discharge gas and completing a panel assembly, aging which makes all the electric discharge cells within a display surface turn on continuously over predetermined time is performed. Electric discharge is stable, while the surface part of a dielectric layer is cleaned physically and chemically, electric discharge starting potential falls and a drive becomes easy by aging.

[0005] Drawing 7 is the outline top view showing the aging state in PDP. PDP21 draw two or more display electrodes X and the electrode terminal of Y by turns at the right-and-left end on one substrate. And the electrode terminal of two or more address electrodes A which intersect perpendicularly with these is drawn at the upper

and lower ends on the substrate of another side. It ages by impressing predetermined voltage from the exchange power supply 23, where common connection is made, respectively with the short bars 22X, 22Y, and 22A of exclusive use [the display electrode X of these plurality, Y, and the electrode terminal of the address electrode A].

[0006] That is, the direct-current power supply and the switching element are built in the exchange power supply 23, and while impressing the voltage of the shape of a pulse which polarity replaces by turns to the short bar 22X and the short bar 22Y, the plus terminal potential of a direct-current power supply is connected to the short bar 22A. Therefore, whenever the polarity of the relative voltage between the display electrodes X and Y changes, while becomes **** potential, and opposite electric discharge arises between a display electrode and the address electrode A.

[0007] In addition, although the address electrode A is connected to the short bar 22A on upper-and-lower-ends both sides, respectively, it is for this making aging possible, when disconnection exists in the address electrode A. A disconnection part is relievable by repairing after aging. Drawing 8 is a perspective view for explaining the conventional aging method and equipment. Conventionally, when aging, connection between each electrode and a short bar is made by equipping with the pinching member of clip 24 grade, as shown in drawing 8. The short bar 22X covers a metal fiber to the flexible member of a square pillar, is pressing to PDP21 with a clip 24, and is changing the display electrode X (refer to drawing 7) into the state of connecting in common. On the other hand, the short bar 22Y by the side of opposite is making common connection of the display electrode Y.

[0008] In addition, in drawing 8, since the short bar 22A is located in the back side, it is in the state of not being visible, but was pressed by PDP21 with a clip 24 and has connected the address electrode A to the short bar 22X and the 22Y said appearance in common. Thus, PDP21 to which the short bar was connected by the clip 24 are laid on the panel installation stand 25 in an aging room (with no illustration). Near the panel installation stand 25, it has the exchange power supply 23 (refer to drawing 7), and it connects as an exchange power supply and each short bar explained by drawing 7. Connection between this exchange power supply and each short bar is made, for example using the cable for connection.

[0009] As mentioned above, in the state where PDP21 were laid in the panel installation stand 25 of the aging interior of a room, it ages by supplying desired voltage to each short bar.

[0010]

[Problem(s) to be Solved by the Invention] According to the above-mentioned conventional aging method and equipment, the worker is performing wearing of the clip 24 for connection between each electrode and a short bar using the ** implement which can open and close a clip, and it requires time and effort. Since the number of clips to be used is increased in order to connect a positive short bar especially to all the electrodes, the time and effort is great.

[0011] Furthermore, the man day for putting PDP21 which connected the short bar on the installation stand 25 is also required. Moreover, since PDP is directly equipped with a clip while becoming loose connection by position gap of a short bar etc., since it is clip wearing by a worker even if it increases the number of clips, breakage may be caused to PDP.

[0012] This invention aims at offering the aging equipment which can be carried out efficiently and certainly, without solving the above-mentioned technical problem and requiring a help.

[0013]

[Means for Solving the Problem] [the aging equipment of the plasma display panel of this invention for solving the above-mentioned technical problem] The tray which has a short bar for making common connection of the electrode group of the panel concerned, and a contact button to the source for aging of voltage at least, The aging room which is connected to the shelf and the source for aging of voltage in which this tray is accommodated, and this source for aging of voltage, and has a contact button on said tray, and a connectable contact button at least, It is characterized by composition equipped with the conveyance machine to which said tray is made to carry in to the shelf of said aging room, and both contact button is connected.

[0014] Since according to above this inventions the tray which can perform inter-electrode short-circuit easily can be equipped with a plasma display panel, this can be conveyed automatically individually and it can change into an aging state, It becomes possible to age efficiently certainly, without requiring a help.

[0015]

[Embodiment of the Invention] The work example of this invention is explained in detail hereafter, referring to Drawings. Drawing 1 - drawing 3 are figures for which one work example of the aging equipment of this invention is shown, and, as for an appearance perspective view and drawing 2, an upper surface figure and drawing 3 of drawing 1 are front views. [the aging equipment 1 of this example] so that clearly from drawing 1 - drawing 3 The panel wearing machine 6 (it omits in drawing 2) which equips a tray 11 with a panel 10 in the aging room 2 which has two or more installation shelves 3 (it omits in drawing 3), the panel applied part 5 which equips a tray 11 with a panel 10, and the panel applied part 5, It consists of a passageway to room 4 which performs carrying-in taking out of the tray conveyance machine 7 which takes out a tray 11 from carrying in or the aging room 2 in the aging room 2, the panel secession part 8 which removes the panel 10 after aging from a tray 11, the panel secession machine which is not illustrated, and a panel 10, and a taking-out way 9.

[0016] A series of aging processes in the aging equipment 1 of such composition are explained. First, a panel 10 is carried in by the passageway to room 4. This panel 10 pastes together a pair of glass substrates with which an electrode, a dielectric layer,

etc. are formed, respectively, it is a plasma display panel in the state where the electric discharge space between substrates was filled up with predetermined electric discharge gas, and the electrode terminal is drawn by the end.

[0017] If a panel 10 is carried in to a predetermined position, the panel wearing machine 6 in the upper part will hold a panel 10. The panel wearing machine 6 is equipped with the pinching nail 6a which pinches a panel 10 and which can be slid, and as shown in the front view of drawing 3, a panel 10 is held with this pinching nail 6a. The panel wearing machine 6 operates like the arrow of drawing 3 in this state, and the tray 11 put on the panel applied part 5 is equipped with a panel 10. This panel wearing is explained referring to the detail view of a tray 11 behind.

[0018] The panel applied part 5 is equipped with the power supply, voltage is supplied to the panel 10 with which the tray 11 was equipped, and it changes into a complete lighting state. By checking a lighting state here, it is possible to take correspondence of excepting an obstacle article beforehand. Next, by the tray conveyance machine 7, in the aging room 2, the tray 11 on which it was equipped with the panel 10 passes the conveyance mouth 2a (refer to drawing 3), and is conveyed. It is equipped with the arm 7a which extends to both sides on the upper surface, and holds a tray 11 while it is movable into the aging room 2 from the side of the panel applied part 5, as the tray conveyance machine 7 shows [an arrow] to drawing 2. Moreover, it also has the up-and-down motion part 7b for moving a tray 11 in the up-and-down direction.

[0019] With the tray conveyance machine 7 which performs the above operation, a tray 11 is conveyed to the predetermined installation shelf 3. Individual information is given by the bar code etc., when carried in to aging equipment 1 by the panel 10 (for example, before being pinched by the panel wearing machine 6), a bar code is read by it, and the processing method within aging equipment 1 is determined as it.

[0020] That is, since interference between panels may have a bad influence depending on the aging condition when it is necessary to change aging time and impressed electromotive force for every panel, you have to take into consideration the position of the installation shelf 3 in the aging room 2. Therefore, the problem by the above-mentioned interference is avoided by transmitting the information to the equipment side beforehand like the above.

[0021] That is, after the tray conveyance machine 7 which received the tray 11 by Arm 7a recognizes the position of the installation shelf 3 in which a tray 11 should be laid and moves to the predetermined position in the aging room 2, it lays a tray 11 to the desired installation shelf 3 by operation of the up-and-down motion part 7b and Arm 7a. Even after being laid on the installation shelf 3, the intensive surveillance of two or more trays 11 will be carried out by computer.

[0022] By laying a tray 11 in the installation shelf 3 although not illustrated, since the installation shelf 3 was equipped with the contact part connected to an exchange power supply and the contact part corresponding to this is prepared also in the tray 11 Contact parts contact and predetermined voltage is supplied to a panel 10. By repeating operation like the above, two or more panels 10 with which a tray 11 is

equipped are changed into an aging state in the aging room 2.

[0023] Since the panel 10 has emitted a considerable quantity of heat during aging, in order to prevent the rise in heat in the aging room 2, it is not illustrating, but while sending in **** by a fan, it is exhausting. According to individual information, the panel 10 which predetermined aging ended is taken out from the aging room 2 by the tray conveyance machine 7 in the state of tray wearing, and is put on the panel secession part 8 by operation of the arm 7a of the tray conveyance machine 7.

[0024] The panel secession part 8 as well as the panel applied part 5 is equipped with the power supply, and it is possible to carry out the lighting examination after the end of aging. This is for detecting poor lighting resulting from having aged. Thus, after doing a lighting examination, a panel 10 is removed for the panel secession machine which is not illustrated from a tray 11.

[0025] Although the panel secession machine which removes a panel 10 from a tray 11 is not illustrated, it is the same as that of the panel wearing machine 7, and if between the panel applied part 5 and the panel secession parts 8 is made movable, it is also possible to make it serve a double purpose by one set. The panel 10 removed from the tray 11 is sent to the following process by the taking-out way 9.

[0026] In the upper surface figure of drawing 2 although the cart 12 for trays is shown. This carries out the obstacle article which can intervene now between the panel applied part 5 and the panel secession part 8, and is detected in the lighting examination in the panel applied part 5 out of aging equipment, and enables operation of processing by a manual. The power supply possesses also in the cart 12 for trays, and it is possible to supply voltage to a panel 10 and to change into a lighting state by carrying a tray 11.

[0027] Next, it explains in detail, referring to drawing 4 - drawing 6 for the composition of the tray 11 concerning this example, and wearing on the tray 11 of a panel 10. It is the side view in which drawing 4 shows the appearance perspective view of the tray 11 of this example, and drawing 5 shows the wearing process of a panel 10, and drawing 6 is the elements on larger scale of a tray 11 further. The tray 11 of this example is equipped with the metal movable board 13 which has the short bar 14 on all sides, as shown in drawing 4. The protective cover 16 which covers the circuit board 18 and this circuit board which mounted the panel installation stand 17, the control circuit which generates the control signal for aging, etc. in the field surrounded with this movable board 13 is provided. And the movable board 13 and the circuit board 18 are electrically connected by the connecting cable 15.

[0028] Moreover, although not illustrated, the tray 11 is equipped with the fan for cooling in order to correspond to generation of heat by the circuit board 18. It faces equipping with a panel 10 to such a tray 11. With the panel wearing machine 7 (refer to drawing 1) mentioned above, after laying a panel 10 in the panel installation stand 17 of a tray 11, each electrode group is connected in common by contacting the short bar 14 of the movable board 13 to the electrode of a panel 10 (short).

[0029] As shown in drawing 5 (a), it is unified possible [a slide of a pair of slide boards 13a and 13b], and changes the movable board 13 into the state where it inclined so that it might open outside, at the time of un-equipping with a panel 10. Although a pair of these slide boards 13a and 13b are not shown in a figure, when mutual is held with the spring etc. and does not apply power, both maintain the state where it separated like drawing 5 (a).

[0030] Moreover, the fitting nail 13c is formed in one slide board 13a, 13d of fitting slots are established in the slide board 13b of another side, respectively, and it fits in by making it slide. While raising the inclining movable board 13 like drawing 5 (a) so that it may become perpendicular after laying a panel 10 in the panel installation stand 17, one slide board 13a is made to slide below. The arrow shows operation of each part of these movable boards 13 to drawing 5 (a).

[0031] By such operation, as shown in drawing 5 (b), it will be in the state where the movable board 13 becomes perpendicular and the fitting nail 13c and 13d of fitting slots fit in, and a pair of slide boards 13a and 13b will sandwich panel 10 end face. Therefore, the short bar 14 contacts the electrode terminal drawn by the end face of a panel 10. In addition, in drawing 5, in order to show the received example which is exposed so that a lower part may be turned to and for which the short bar 14 is contacted, the short bar 14 is formed in the slide board 13b located in the bottom.

[0032] Although a help is sufficient as operation of the movable board 13, it is desirable by carrying out automatically by a robot arm etc. to raise working efficiency. Drawing 6 is the perspective view which expanded some movable boards 13, and explains the connection structure of the electrode terminal on a panel, and a short bar. As shown in drawing 6 (a), as for one slide board 13a, the upper part is crooked, among those the buffer members 13e, such as rubber, are attached to the upper surface. Moreover, the short bar 14 is attached to the slide board 13b of another side so that the buffer member 13e may be countered. This short bar 14 is made into the structure which covered the surface of the flexible member 14a on a pillar with the metal fiber 14b.

[0033] By facing across a panel end with the buffer member 13e and the short bar 14 of a pair of such slide boards 13a and 13b, the short bar 14 will be contacted for two or more electrode terminals drawn by the panel end, and common connection of two or more electrodes will be made. As mentioned above, since the short bar 14 consists of flexible members 14a, when a panel is inserted, it changes and ensures contact with the metal fiber 14b and electrode terminal to cover. Moreover, since the opposite part of the short bar 14 is the buffer member 13e, it does not do damage to a panel.

[0034] Furthermore, since the electrode terminal on a panel 10 is a structure inserted with a pair of slide boards 13a and 13b which have the short bar 14, it can respond also to the curvature of a panel 10 and can acquire a short state (common connection of an electrode group) certainly. Drawing 6 (b) is the thing of structure where the short bar 14 is attached to the upper slide board 13a, and the buffer member 13e is attached to the lower slide board 13b, and short-circuits to the electrode terminal drawn by turning [panel] to the upper part.

[0035]

[Effect of the Invention] Since according to the aging equipment of the plasma display panel of this invention the tray which can short-circuit an electrode group easily can be equipped with the panel concerned, this can be conveyed automatically individually and it can change into an aging state, It becomes possible to age efficiently certainly, without requiring a help.

[Brief Description of the Drawings]

[Drawing 1] It is the appearance perspective view of the aging equipment concerning this invention.

[Drawing 2] It is the upper surface figure of the aging equipment concerning this invention.

[Drawing 3] It is the front view of the aging equipment concerning this invention.

[Drawing 4] It is the appearance perspective view of the tray concerning this invention.

[Drawing 5] It is a figure for explaining the panel wearing process to a tray.

[Drawing 6] It is the elements on larger scale of the movable board in a tray.

[Drawing 7] It is the outline top view showing the aging state of PDP.

[Drawing 8] It is a perspective view for explaining the conventional aging method and equipment.

[Description of Notations] 1 Aging Equipment 2 Aging Room 3 Installation Shelf 4 Passageway to Room 5 Panel Applied Part 6 Panel Wearing Machine 7 Tray Conveyance Machine 8 Panel Secession Part 9 Taking-Out Way 10 Panel 11 Tray 13 Movable Board 14 Short Bar

[Translation done.]

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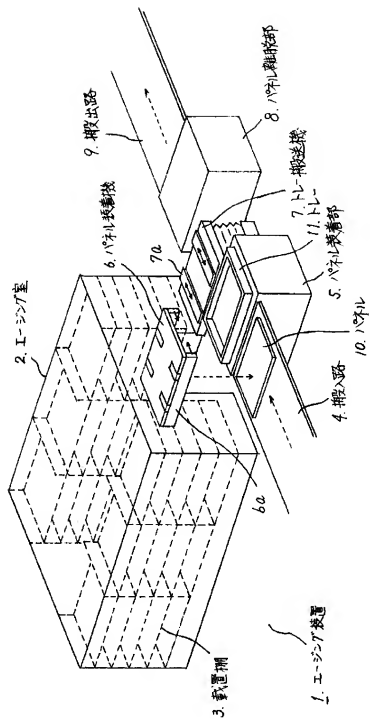
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[Document Name] Drawings

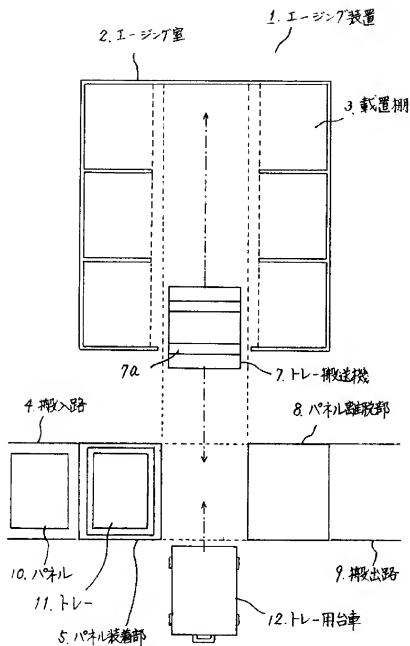
[Drawing 1]

[Drawing 2]

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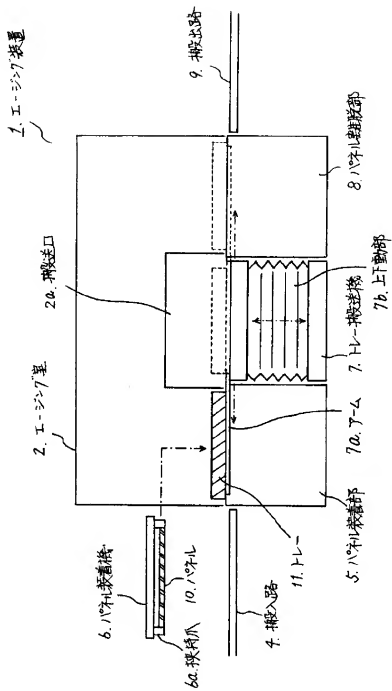


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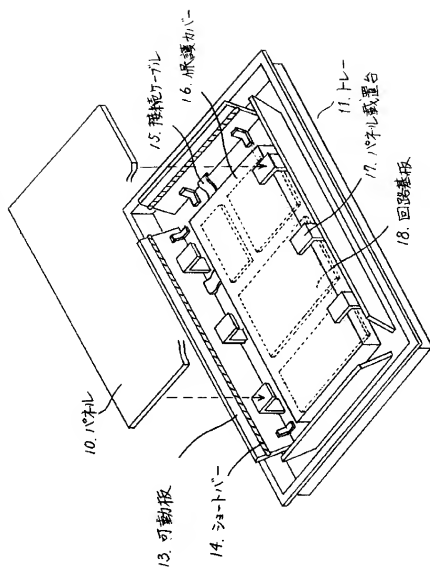


[Drawing 3]

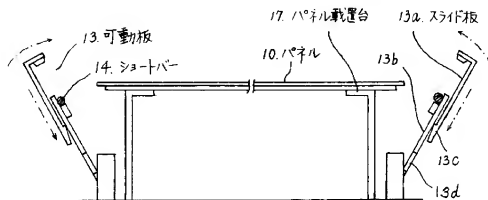
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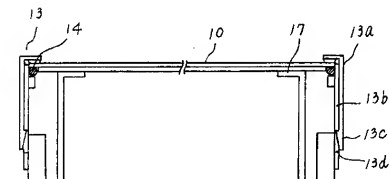
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トレーへのパネル装着工程を説明するための図

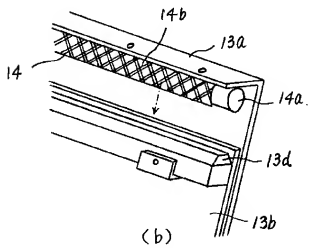
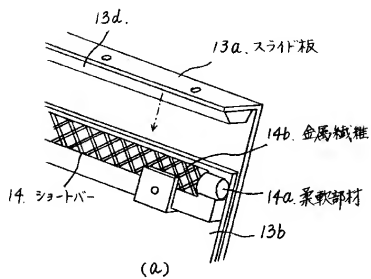


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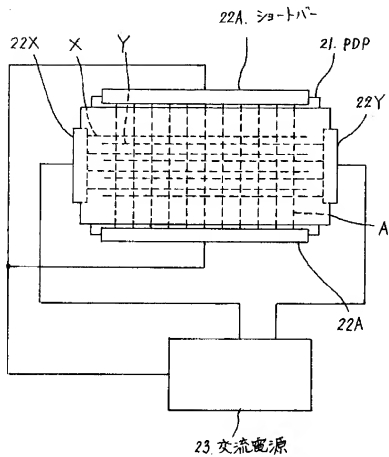


(b)

トレーにおける可動板の部分拡大図



PDPのエージング状態を示す概略平面図



[Drawing 8]

従来のエージング方法及び装置と説明するための斜視図

